



SCARMJET

(KEROSENE) 30 atm 1270 K HTPB

[] (Angus et al)

[] (Ben-Yakar et al) ، تراست مخصوص، ضربه ویژه، می باشد همخوانی خوبی با نتایج تجربی منتشر شده دارد که مبین صحت شبیه سازی عددی می باشد.
SCRAMJET :

[] (Jarymowycz et al)

[]

(Ben-Arosh et al) (SFRJ) SFRJ

NASA (Shimon) [] X43A (Alon Gany)

[]

[] (

(SCRAMJET)

(Scramjet)

$$\frac{\partial}{\partial x_j}(\rho u_j) = 0 \quad ()$$

ρ j u_j

0/247

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$$\frac{\partial}{\partial x_j}(\rho u_i u_j) = -\frac{\partial p}{\partial x_i} + \frac{\partial}{\partial x_j} \left[\mu \left(\frac{\partial u_i}{\partial x_j} + \frac{\partial u_j}{\partial x_i} - \frac{2}{3} \frac{\partial u_k}{\partial x_k} \delta_{ij} \right) \right] \quad ()$$

δ_{ij} μ p

0/0197

$$\frac{\partial}{\partial x_j}(\rho u_i H) = \frac{\partial}{\partial x_j} \left(\kappa \frac{\partial T}{\partial x_j} \right) + \frac{\partial}{\partial x_j} \left(\mu \left(\frac{\partial u_i}{\partial x_j} + \frac{\partial u_j}{\partial x_i} - \frac{2}{3} \frac{\partial u_k}{\partial x_k} \delta_{ij} \right) \right) - \frac{\partial}{\partial x_j} (J_{ij} h_i) + S_a \quad ()$$

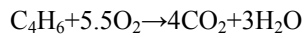
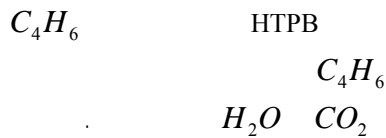
h_i J_{ij} κ H
 S_a i

(RNG) $k - \varepsilon$

$k - \varepsilon$

EDDY-DISSIPATION

1000K



HTPB

14 S

Scramjet
0/0197 Kg/s

()

(t=7 S)

(t=14S)

(()) 1200 K

)

(

()

45% 35%

1270 K

HTPB

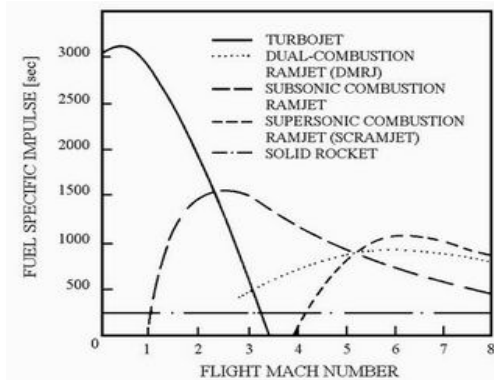
30 atm



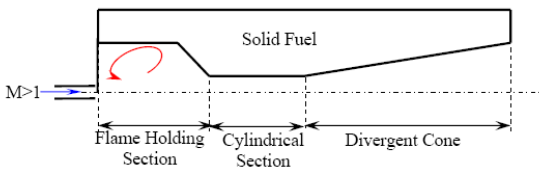
45% 35%

(())

(())



3099 K



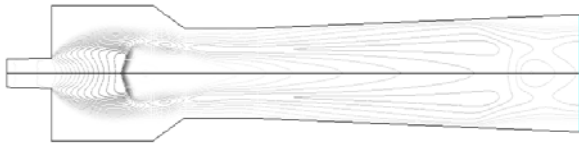
$6/8 \text{ N.S./Kg}$

662 N.S./Kg

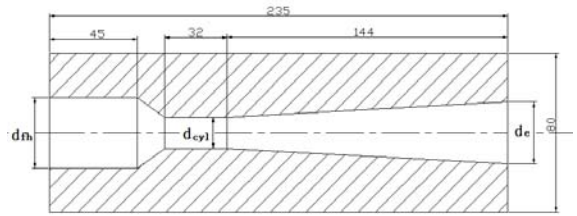
848 S

8/7 S

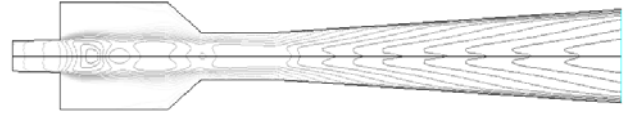
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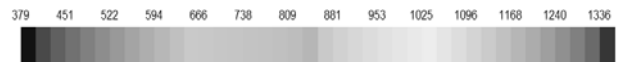
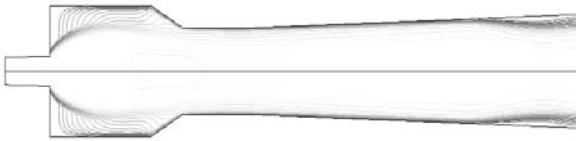
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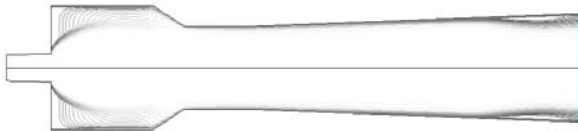


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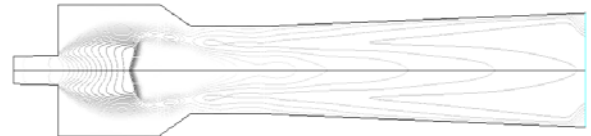
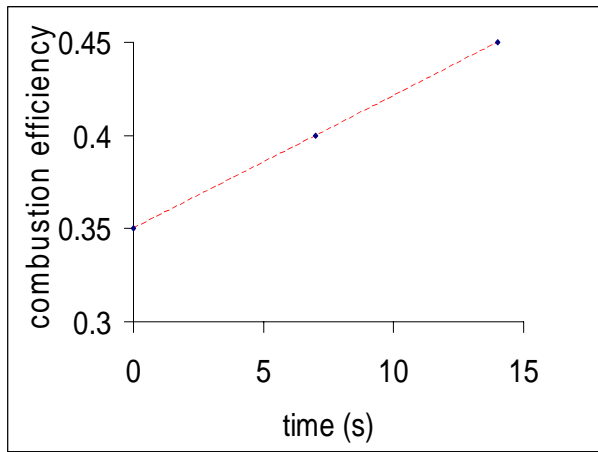
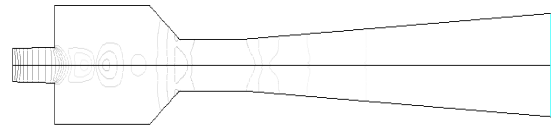


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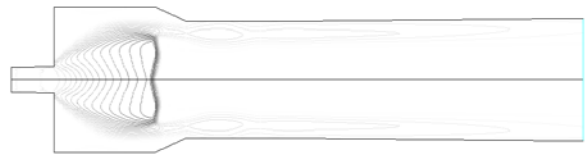
() ()



CO_2



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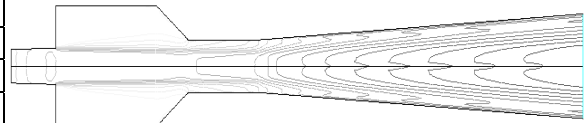
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() ()

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(

d_{in}			
d_{cyl}			
d_e			



()

(^{N.S}/_{kg})

(S)

1. Curran, E. T. and Murthy, S. N. B. "Scramjet Propulsion". Volume 189, AIAA Inc. Washington D C, USA, 2002.

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3. Ben-Yakar, A. and Alon Gany. "Experimental Study of a Solid Fuel Scramjet". Journal of Propulsion and Power, Vol. 14, No. 4, 1998, pp. 447-455

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